

DaimlerChrysler AG

Patent Claims

1. Running gear toothing (20, 120, 220, 320), characterized in that its surface is generated at least partly by electrochemical erosion.
2. Running gear toothing according to claim 1, characterized in that a reinforcing rib is formed at the teeth of the running gear (120, 220, 320) as one piece in the intervening spaces between its teeth.
3. Running gear according to one of the preceding claims, characterized in that a reinforcing rib (reinforcing cover 340, 326) extends between the teeth of the running gear (320) at least on one of the front ends of its teeth.
4. Running gear according to one of the preceding claims, characterized in that the running gear toothing (220) belongs to a gearwheel (bevel pinion 225), on whose front side an electrode (219) can be placed having a recess (232) with an internal toothing in the negative shape of the overall running gear toothing (220).
5. Running gear according to claim 4, characterized in that the running gear toothing (220) is a spiral toothing.
6. Running gear according to one of the claims 1 to 3, characterized in that the running gear toothing (20, 120) belongs to a ring gear (18, 118), on which an electrode (19) can be placed having on its front side a toothing in the negative shape of the overall running gear toothing (20, 120).
7. Running gear according to claim 6, characterized in that the ring gear (118) comprises a surrounding reinforcing rib (123).

8. Running gear according to claim 5 or 6, characterized in that the ring gear (18, 118) is formed on a differential casing (3, 103) as one piece.
9. Running gear according to claim 1, characterized in that the running gear toothing is part of a differential spur gear (4a) of a crown gear differential (1) which is provided with reinforcing covers (9a, 10a) on both sides.
10. Running gear according to one of the preceding claims, characterized in that the surface of the rolling region of the running gear is generated through electrochemical erosion.
11. Method for producing a running gear toothing (20, 120, 220, 320), characterized in that the running gear toothing (20, 120, 220, 320) is preforged or precast in a first step and electrochemically machined in a second step.
12. Production method according to claim 11, characterized in that the first step is performed with oversized dimensions.
13. Production method according to claim 11 or 12, characterized in that for the subsequent step, an electrode (19, 119, 219, 319) is moved into at least one intervening space between the teeth of the running gear (20, 120, 220, 320) up to a flushing gap, during which the running gear (20, 120, 220, 320) is located in an electrolyte bath.
14. Production method according to claim 13, characterized in that a voltage is applied between the running gear (20, 120, 220, 320) and the electrode (19, 119, 219, 319).
15. Production method according to one of the claims 13 or 14, characterized in that the electrode (19, 119, 219, 319) has a negative shape of the overall running gear toothing (20, 120, 220, 320) and machines the running gear toothing by chucking.
16. Production method according to claim 15, characterized in that the running gear toothing (20, 120, 220) belongs to a toothed gearwheel (ring gear 18, ring gear 118,

pinion shaft 225), and the electrode (19, 119, 219) is fed to the running gear (20, 120, 220) with a relative movement axially with respect to a rotational axis (230) of the gearwheel (ring gear 18, ring gear 118, pinion shaft 225) of the running gear toothing [sic] (20, 120, 220) for the machining that occurs in the next step.

17. Production method according to claim 16, characterized in that the running gear toothing (220) is a helical or spiral toothing, and the electrode (219) rotates in a relative fashion according to the helical or spiral toothing during its relative axial movement during the feed process.

18. Production method according to one of the claims 13 to 15, characterized in that the electrode (219) has the negative shape of a single intervening space between teeth.

19. Production method according to claim 18, characterized in that a plurality of electrodes (619a, 619b) which are provided with the negative shape of a single space between teeth are simultaneously fed to the running gear for electrochemical machining.

20. Production method according to one of the claims 18 or 19, characterized in that the electrode (319, 619a, 619b) is fed to the running gear (320) radially.

21. Production method according to claim 19, characterized in that the electrodes (419a, 419b, 419c, 419d, 419e) are conductively interconnected.